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Poran et al.

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(54) **FOLDABLE CRATE AND LOCKING MECHANISMS THEREFOR**

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(51) **Int. Cl.**

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B65D 6/26	(2006.01)
B65D 6/18	(2006.01)
B65D 6/16	(2006.01)

(52) **U.S. Cl.**
CPC ***B65D 21/086*** (2013.01); ***B65D 7/26*** (2013.01); ***B65D 7/30*** (2013.01); *B65D 11/18* (2013.01); *B65D 11/1833* (2013.01)

(58) **Field of Classification Search**
CPC B65D 7/30; B65D 7/26; B65D 21/086; B65D 11/1833; B65D 11/18
USPC 220/6, 7, 666
See application file for complete search history.

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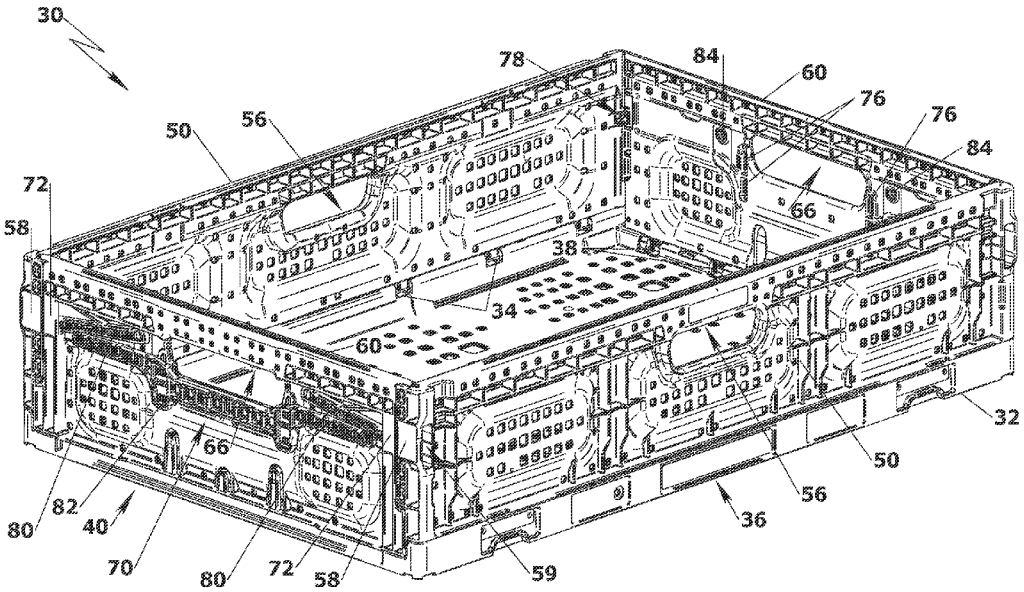
(57) **ABSTRACT**

A foldable crate includes a base platform, a pair of longitudinal sidewalls forming a hinged connection with the base platform and a pair of flanking sidewalls forming a hinged connection with the base platform. The flanking sidewalls accommodate a pair of rotary locking elements, as well as unlocking element.

19 Claims, 5 Drawing Sheets



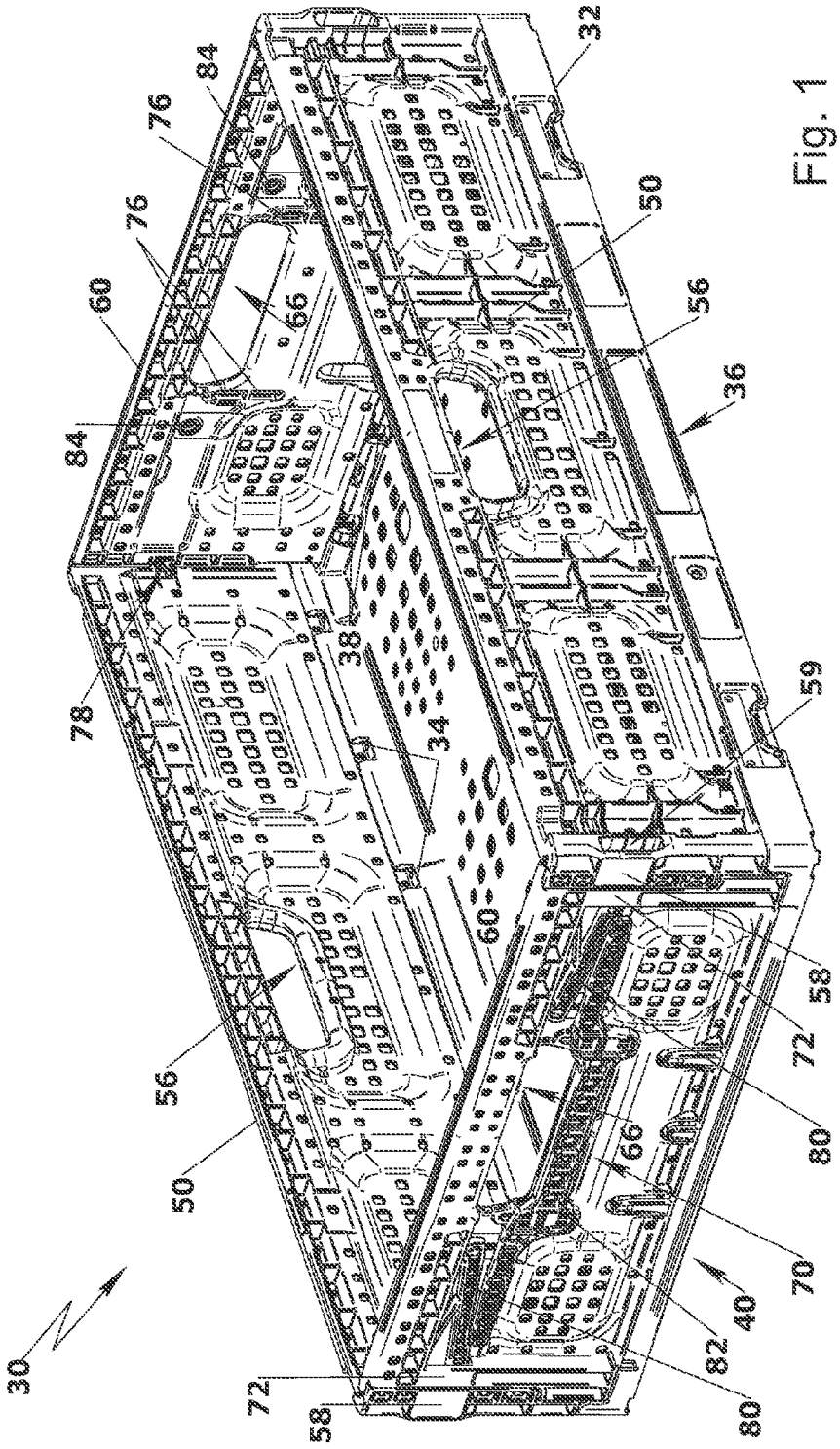

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Fig. 1

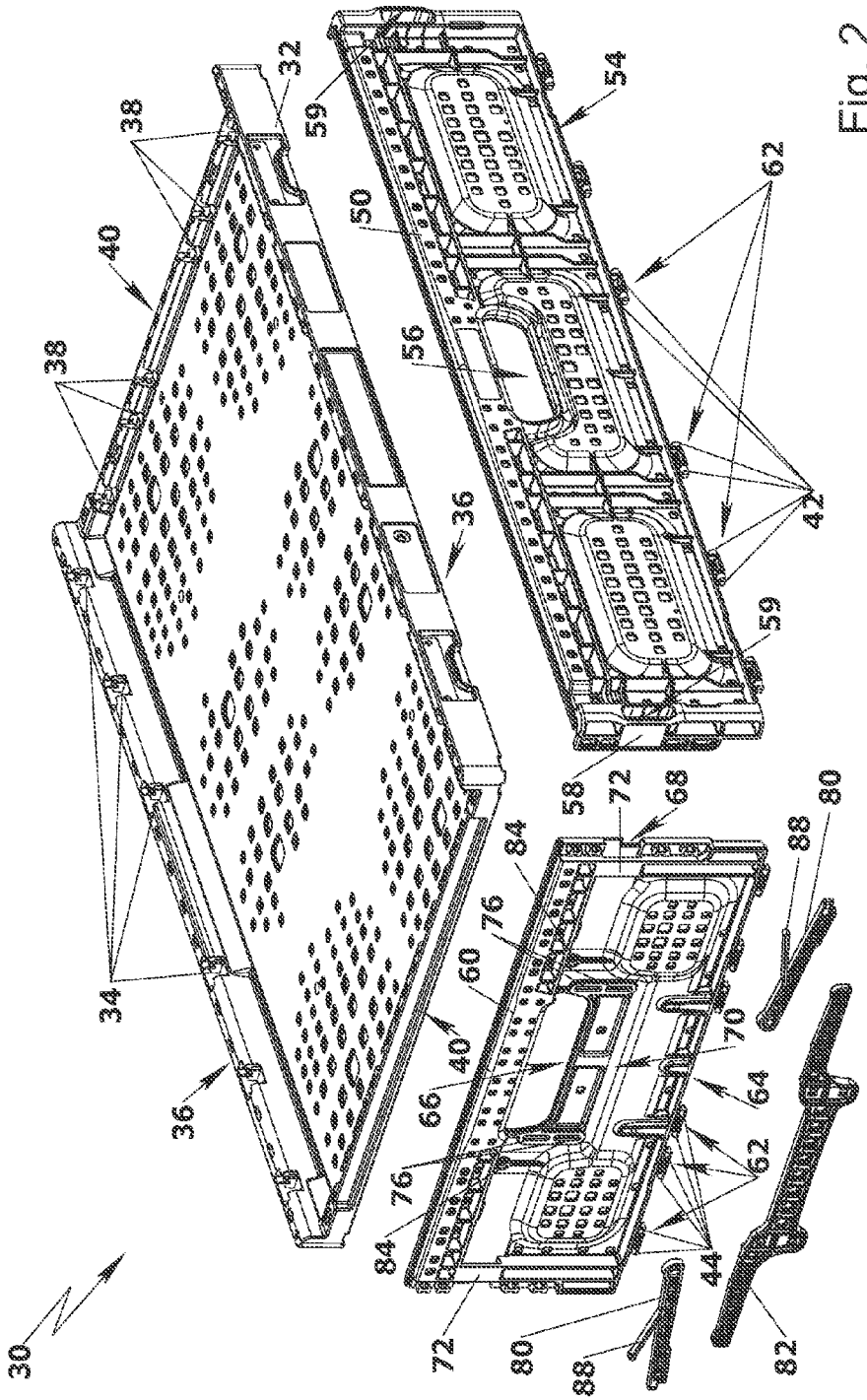
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Fig. 2

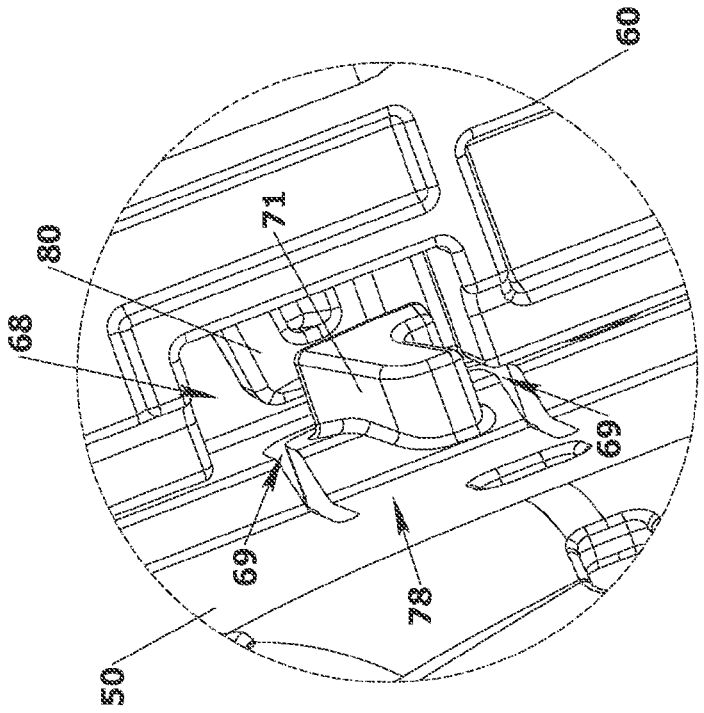


Fig. 3B

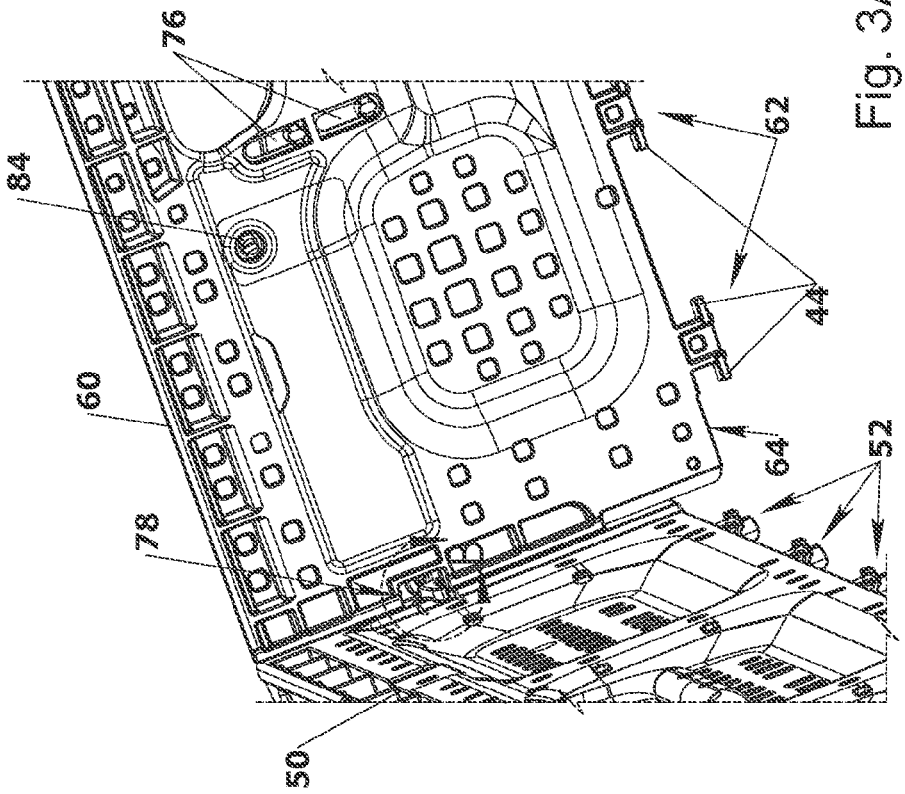


Fig. 3A

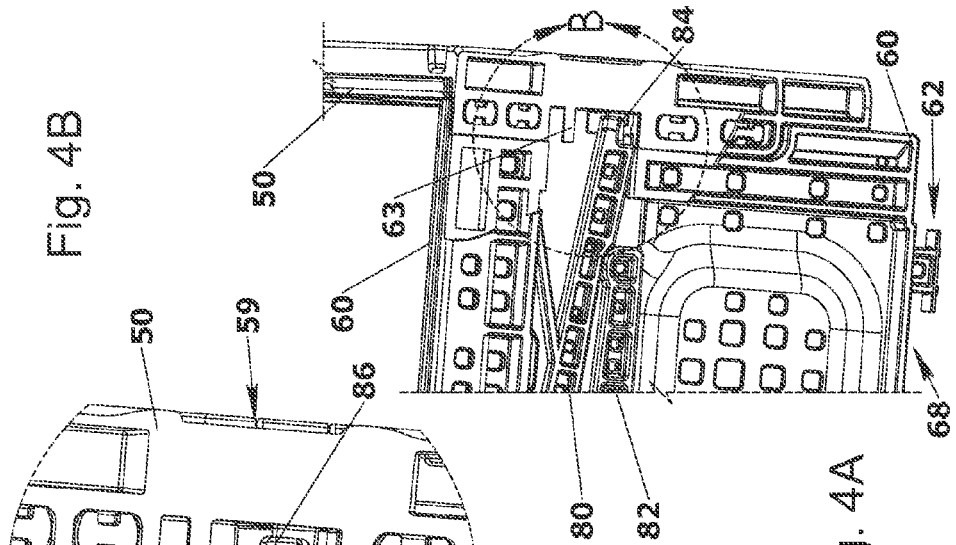
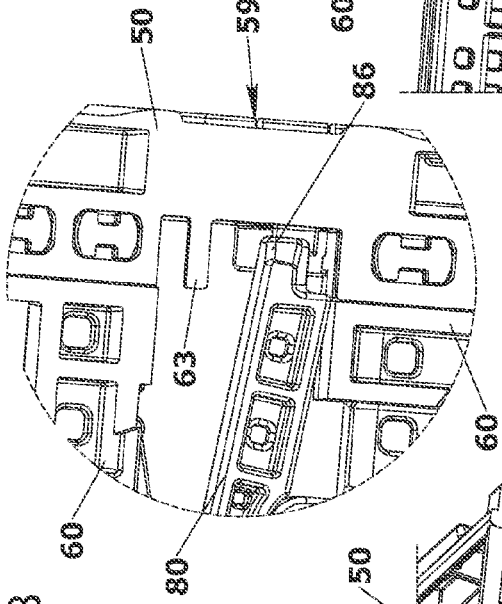


Fig. 4A

Fig. 4B



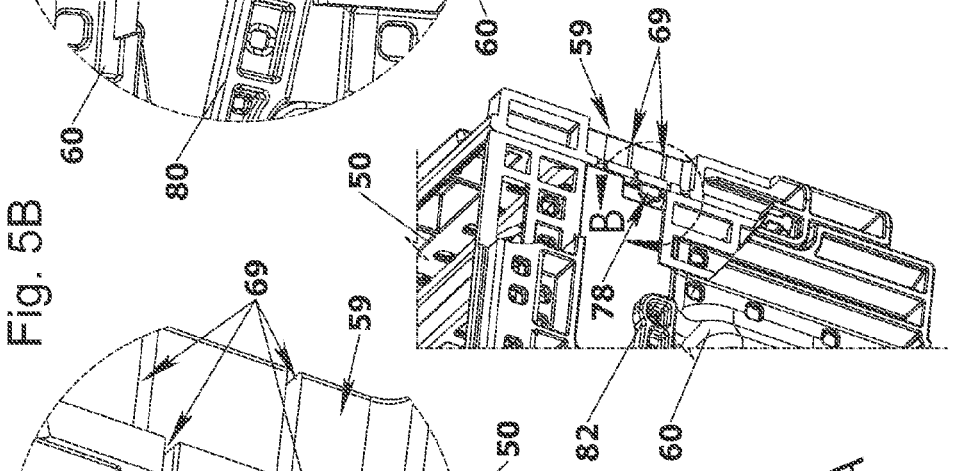
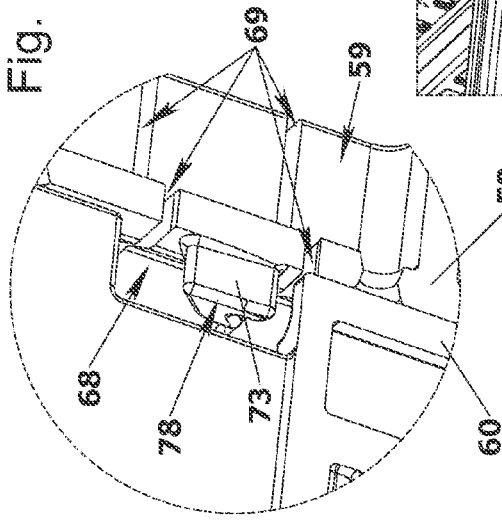


Fig. 5A

Fig. 5B



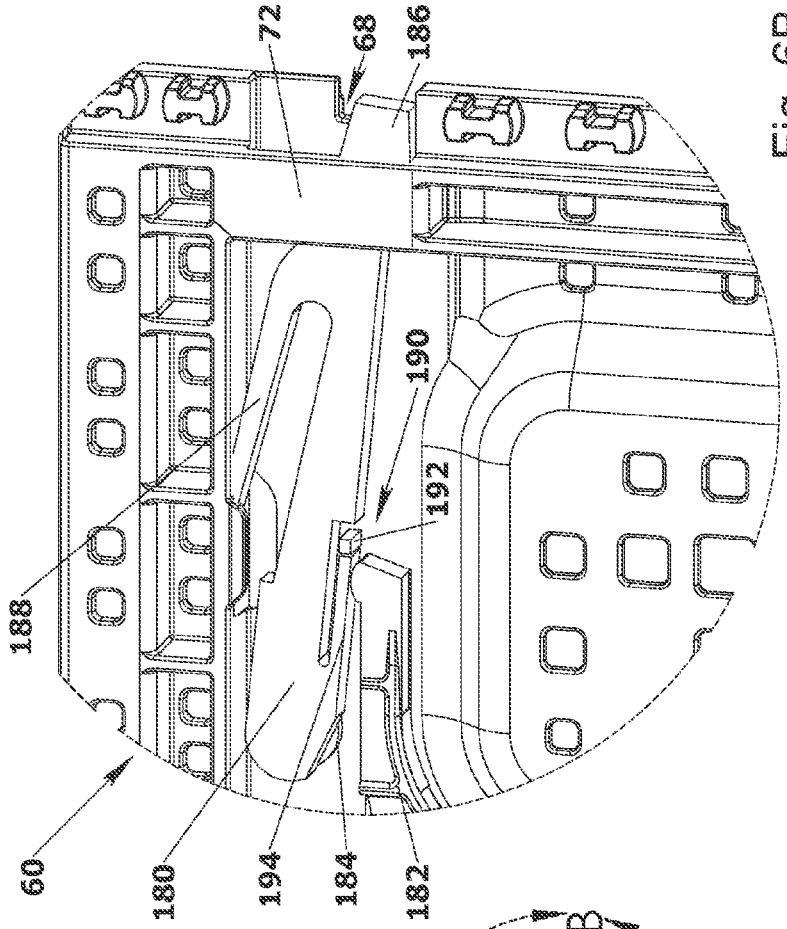


Fig. 6B

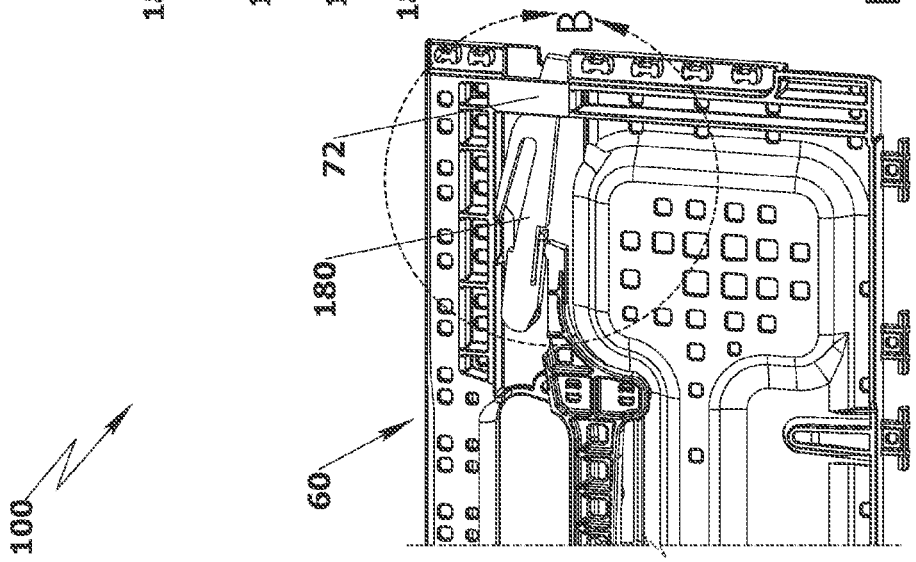


Fig. 6A

FOLDABLE CRATE AND LOCKING MECHANISMS THEREFOR

TECHNICAL FIELD

The present invention pertains to containers, in particular foldable crates and locking mechanism therefor. In particular, the invention relates to advances in and elaborations of locking mechanisms for foldable crates.

BACKGROUND OF THE INVENTION

Foldable crates are widely used these days. There are numerous solutions known in the art for locking mechanisms for foldable crates. The general concept of such locking mechanisms is that a foldable crate can be secured in open conformation, by a locking mechanism, which is releasable by an actuator, typically a tab surrounding the handle of the crate. It is believed that the pertinent state-of-the-art is represented by: U.S. Pat. No. 7,861,878, U.S. Pat. No. 6,290,081, US20100230406, US20120091133 and US20100320202; EP2431283 and EP1655232, as well as by WO2010146190, WO2009100799 and particularly DE10137328.

US20120091133 discloses a collapsible box including a plastic structure with a rectangular base, two ends, and two sides which are pivotably coupled to the base. The ends include centered parts combined with latches, which in one position anchor the sides and ends, while in another position the connection between the ends and the sides is released in order to collapse the elements. The collapsible box of US20120091133 is characterized in that the box includes an anchor device consisting of a series of rotary bodies that connect the latches to the centered part via two pairs of resilient parts and which, in the inoperative position thereof, hold the latches outwards, attaching the ends and the sides. When the central part is moved upward, the latches thus release the ends and the sides.

U.S. Pat. No. 7,861,878 discloses a fastening device for folding boxes. The folding boxes include a bottom and four lateral walls coupled in jointed fashion to the edges of that bottom, two opposite walls each having a fastening device for ensuring the unfolding of the box. The fastening devices of U.S. Pat. No. 7,861,878 include a vertically displaceable central piece and lateral bolts with horizontal displacement for fastening the lateral walls via their adjacent edges. The fastening device of U.S. Pat. No. 7,861,878 includes elastic spring elements that link the central control piece with pairs of the lateral bolts. The spring elements, in the rest position, maintain the bolts in an engagement and fastening position. The release position of the bolts in U.S. Pat. No. 7,861,878 results when the spring elements pull the bolts against the resistance of the elastic elements.

DE10137328 that is considered the most relevant prior art publication discloses an assembly, adapted to open and close side walls of a plastic and reusable box or container, which have a manual locking unit, with at least one projection, which grips over a ratchet hook on the longitudinal wall. The lock operating control is adapted to grip, carry the box or container and also unlock the side walls.

SUMMARY OF THE INVENTION

The invention relates to advances in and elaborations of locking mechanisms for foldable crates.

There is provided in accordance with embodiments of the present invention a foldable crate including a base platform, a pair of longitudinal sidewalls forming a hinged connection with the base platform and a pair of flanking sidewalls forming a hinged connection with the base platform. The flanking sidewalls accommodate a locking mechanism and unlocking mechanism.

In accordance with some embodiments of the present invention, the locking mechanism includes a pair of rotary locking elements, pivoting upon axes on flanking sidewalls, as well as a pair of respective protrusions inwardly facing from longitudinal sidewalls.

In accordance with some embodiments of the present invention, the unlocking mechanism includes a manual deactivator, configured to exert a rotational torque upon rotary locking elements.

It should be understood, however, that the summary above is not intended to limit the invention to the particular forms and examples, rather on the contrary, is to cover all modifications, equivalents, and alternatives falling within the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood and appreciated more comprehensively from the following detailed description taken in conjunction with the appended drawings in which:

FIG. **1** an isometric view of an assembled foldable crate in an open conformation and locking/unlocking mechanism therefor, in accordance with an embodiment of the present invention;

FIG. **2** is an exploded isometric view of a base platform, a longitudinal sidewall and a flanking sidewall of an embodiment of the foldable crate as well as of a pair of rotary locking elements of the locking mechanism thereof and manual deactivator of the unlocking mechanism thereof;

FIG. **3**A is a posterior perspective elevated view of the locking mechanism of the foldable crate;

FIG. **3**B is an enlarged posterior perspective elevated view of the locking mechanism of the foldable crate shown in FIG. **3**A;

FIG. **4**A is an elevated frontal cut-away view of the flaking sidewall, showing a terminal portion of a rotary locking element of the locking mechanism of the foldable crate;

FIG. **4**B is an enlarged elevated frontal cut-away view of the flaking sidewall, showing a terminal portion of a rotary locking element, shown in FIG. **5**A;

FIG. **5**A is an elevated perspective frontal cut-away view of the flaking sidewall, showing an inwardly facing protrusion on the longitudinal sidewall;

FIG. **5**B is an enlarged elevated perspective frontal cut-away view of the flaking sidewall, showing the inwardly facing protrusion on the longitudinal sidewall, shown in FIG. **5**A;

FIG. **6**A is a perspective frontal view of the flaking sidewall, incorporating another embodiment of locking/unlocking mechanism, with a safety catch feature preventing inadvertent opening of the crate;

FIG. **6**B is an enlarged frontal view of the flaking sidewall, incorporating another embodiment of locking/unlocking mechanism, with a safety catch feature preventing inadvertent opening of the crate, shown in FIG. **6**A.

While the invention is susceptible to various modifications and alternative forms, specific embodiments thereof have been shown merely by way of example in the drawings. The drawings are not necessarily complete and components are

not essentially to scale; emphasis instead being placed upon clearly illustrating the principles underlying the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Illustrative embodiments of the invention are described below. In the interest of clarity, not all features of actual implementation are described in this specification. It will of course be appreciated that in the development of any such actual embodiment, numerous implementation-specific decisions must be made to achieve the developers' specific goals, such as compliance with technology- or business-related constraints, which may vary from one implementation to another. Moreover, it will be appreciated that the effort of such a development might be complex and time-consuming, but would nevertheless be a routine undertaking for those of ordinary skill in the art having the benefit of this disclosure.

FIGS. **1** and **2** show components of an embedment of foldable crate **30** as well as locking elements **80** thereof. Foldable crate **30** comprises base platform **32**. Base platform **32** has a plurality of structural recesses **34**, disposed about longitudinal portion **36** of base platform **32** and structural recesses **38** disposed about flanking portion **40** thereof. The superior face of longitudinal portions **36** of base platform **32** are positioned somewhat higher than the superior face of flanking portion **40**.

Foldable crate **30** further comprises a pair of longitudinal sidewalls **50** and a pair of flanking sidewalls **60**, of which just a single sidewall from each pair is shown. Longitudinal sidewalls **50** include a plurality of structural elements **52**, disposed about bottom portion **54** of the former, whereas flanking sidewalls **60** include a plurality of structural elements **62**, disposed about bottom portion **64** of sidewalls **60**. Structural elements **52** disposed about bottom portion **54** of longitudinal sidewalls **50** further comprise longitudinal pivots **42** configured to form a hinged connection with structural recesses **34**, disposed about longitudinal portion **36** of base platform **32**; whereas structural elements **62**, disposed about bottom portion **64** of flanking sidewalls **60** further comprise flanking **44** pivots, configured to form a hinged connection with structural recesses **38** disposed about flanking portion **40** of base platform **32** of foldable crate **30**. Optionally, at least one of pivots **42** or **44** is a single extended rod, typically metallic, threaded respectively throughout the entire length of longitudinal portion **36** or flanking portion **40** of base platform **32**.

Structural recesses **34**, disposed about longitudinal portions **36** of base platform **32** as well as with structural recesses **38** disposed about flanking portions **40** of base platform **32** typically include apertures (not shown) configured to receive longitudinal pivots **42** and/or flanking **44** pivots, respectively, thereby forming a hinged connection between longitudinal sidewalls **50** and longitudinal portion **36** as well as flanking sidewalls **60** flanking portions **40** of base platform **32**. Longitudinal portions **36** of base platform **32** embodying structural recesses **34** are positioned somewhat higher than flanking structural recesses **38** disposed about flanking portion **40** of base platform **32** embodying structural recesses **38**, whereas longitudinal pivots **42** are positioned somewhat higher than flanking pivots **44**; thereby providing for folding flanking sidewalls **60** inwardly towards bottom and then folding longitudinal sidewalls **50** on top of flanking sidewalls **60** in a folded conformation (not shown) foldable crate **30**.

Longitudinal sidewalls **50** include tabs **56**, adapted to serve as gripping handles. Longitudinal sidewalls **50** include flanking facets **58** extending essentially perpendicularly along a portion of the vertical edges of longitudinal sidewalls **50**. It is further noted that flanking facets **58** of longitudinal sidewalls **50** preferably form enclosed channels **59** within longitudinal sidewalls **50**.

Flanking sidewalls **60** include tab **66**, adapted to serve as a gripping handle. It is noted that flanking sidewalls **60** include side recesses **68**, forming an opening sidewalls **60** allowing passage of protrusion **78** of longitudinal sidewalls **50** upon opening and folding crate **30**. Flanking sidewalls **60** include flanking struts **72**, forming a channel which is in continuum with enclosed channels **59** formed by flanking facets **58** within longitudinal sidewalls **50**.

Flanking sidewalls **60** comprise structured centric recess **70**, essentially surrounding tab **66**. Structured centric recess **70**, of flanking sidewall **60**, is adapted to accommodate unlocking element **82**. Structured centric recess **70** in flanking sidewalls **60** comprises a couple of grooves **76** along a portion of the sides thereof, adapted to accommodate ridges or extensions (not shown) of unlocking element **82** and sustain vertical displacement of the latter within the former.

Referring now to FIG. **3**A to **5**B which show rotary locking elements **80** in greater details. Rotary locking elements **80** are pivoted on pivots **84** positioned typically somewhat offset structured centric recess **70**, in flanking sidewall **60**. Rotary locking elements **80** further comprise or embody leaf-springs **88**, extending from the top face upwards and towards the terminal portion **86** of rotary locking elements **80**.

Locking elements **80** are threaded into channels **59** in flanking sidewalls **60**, underneath flanking struts **72**. It is noted that the channels formed underneath flanking struts **72** are somewhat wider than locking elements **80**; thereby sustaining radial displacement of the latter within the former. Locking elements **80** are furnished with pivots, which are threaded into apertures **84**, at the top portion of flanking sidewalls **60**. Locking elements **80** are rotatable upon pivots threaded into apertures **84**, in flanking sidewalls **60**; thereby sustaining radial displacement of the terminal portion of locking elements **80** within channels formed underneath flanking struts **72** in flanking sidewalls **60**.

Longitudinal sidewalls **50** comprise structured protrusions **78**, extending inwardly from the inner faces of longitudinal sidewalls **50**. U-shaped cut **69** is formed essentially surrounding protrusions **78**, thereby rendering protrusions **78** outwardly displaceable, upon pushing onto protrusions **78** in an outward direction, against the biasing force exerted upon deformation of the material at the basis of U-shaped cut **69**. Structured protrusions **78** of longitudinal sidewalls **50** comprise upwardly oriented back upper face **71** and essentially vertically oriented back upper face **73**, slightly upwardly inclined backwards.

Underneath flanking struts **72**, flanking sidewalls **60** comprise recesses **68** defining an opening towards the interior of crate **30**. Recesses **68** in flanking sidewalls **60** allow structured protrusions **78** of longitudinal sidewalls **50** to surpass the terminal portions of locking elements **80**, while unfolding crate **30** into open conformation, shown in FIG. **1**. Terminal portions of locking elements **80** preferably comprise chamfered or beveled terminal front face **86**. Chamfered or beveled terminal front face **86** of locking elements **80** is to some extent inwardly slanted, facing somewhat towards the corner of crate **30**.

To unfold crate **30** into open conformation, shown in FIG. **1**, initially longitudinal sidewalls **50** are elevated and consequently rotated upwardly and away from base platform **32**, until the former are erected essentially perpendicularly to the latter. Then flanking sidewalls **60** are elevated and consequently rotated upwardly and away from base platform **32**,

until terminal portions of locking elements **80** collide from behind with structured protrusions **78**.

Upon collision of structured protrusions **78** with terminal portions of locking elements **80** and particularly with chamfered or beveled terminal front face **86** thereof, structured protrusions **78** are displaced in an outward direction, while the material at the basis of U-shaped cut **69** is somewhat bent or deformed, forming a biasing force urging structured protrusions **78** in an inward direction. Alternatively or additionally, upon collision of terminal portions of locking elements **80** with structured protrusions **78**, terminal portions of locking elements **80** are displaced in an upward direction, while being contiguously translated upon the surface of upwardly oriented back upper face **71** of structured protrusions **78** on longitudinal sidewalls **50**.

Ultimately, upon elevating flanking sidewalls **60** and consequently rotating the same upwardly and away from base platform **32**, until the former are erected essentially perpendicularly to the latter, terminal portions of locking elements **80** surpass structured protrusions **78**. Upon surpassing terminal portions of locking elements **80**, structured protrusions **78** are spontaneously displaced in an inward direction, due to the biasing force formed by the deformed or bent material at the basis of U-shaped cut **69** spontaneously urging structured protrusions **78** in an inward direction. Alternatively or additionally upon surpassing structured protrusions **78**, terminal portions of locking elements **80** are spontaneously displaced in a downward direction, due to the biasing force exerted by leaf-springs **88** of locking elements **80**, bouncing against inner top face of the top portion of flanking sidewalls **60**.

Upon surpassing structured protrusions **78**, terminal portions of locking elements **80** become locked in front of structured protrusions **78** of longitudinal sidewalls **50**, whereby flanking sidewalls **60** become locked in a perpendicular orientation relatively to base platform **32**, rendering crate **30** locked in open conformation, shown in FIG. **1**.

Unlocking element **82** is slidable in structured centric recess **70**, of flanking sidewalls **60**. Ridges or extensions (not shown) of unlocking element **82** are threaded into grooves **76** of about structured centric recess **70** and slidable therein. Vertical translation of unlocking element **82** upwards is restricted by the length of grooves **76**. Leaf-springs **88** spontaneously drive unlocking element **82** in a downward direction, by bouncing against inner top face of the top portion of flanking sidewalls **60**.

Upon forceful manual elevation of unlocking element **82** in an upward direction, terminal portions of unlocking element **82** exert rotational torque onto locking elements **80**, causing locking elements **80** to rotate upon pivots threaded into apertures **84**, in flanking sidewalls **60**, so that the terminal portions of locking elements **80** are radially displaced in an upward direction and assume a higher position within channels formed underneath flanking struts **72** in flanking sidewalls **60**; thereby rendering crate **30** readily foldable into folded conformation (not shown).

Enclosed channels **59** formed by flanking facets **58** within longitudinal sidewalls **50** preferably comprise separation bumper elements **63**, extending into the channels underneath flanking struts **72** in flanking sidewalls **60**. Separation bumper elements **63** typically include an outwardly slanted bottom face (not shown), facing essentially inwardly and downwardly. Upon forceful manual elevation of unlocking element **82** in an upward direction, the top faces of terminal portions of unlocking element **82** collide with separation bumper elements **63**, preferably with an outwardly slanted bottom face thereof, thereby a normal force is exerted onto terminal portions of unlocking element **82** and in turn onto flanking sidewalls **60** essentially inwardly and downwardly, forming a rotational torque onto flanking sidewalls **60**, causing flanking sidewalls **60** to commence rotating upon flanking pivots **44**, towards base platform **32**, thus initiating the folding of crate **30** into folded conformation (not shown).

It is noted that deepened bottom portion in structured centric recess **70** is used for manual access to unlocking element **82** from underneath. It is further noted that the top face of the central portion of unlocking element **82** is preferably disposed not higher than the bottom face of tab **66** in flanking sidewalls **60**, when unlocking element **82** is in a released position, shown in FIG. **1**; whereas when unlocking element **82** is in an elevated position (not shown), the top face of the central portion of unlocking element **82** partially obstructs tab **66** in flanking sidewalls **60**; thereby preventing inadvertent usage of crate **30**, while unlocking element **82** is in an elevated position (not shown).

Upon release of forceful elevation of unlocking element **82** in an upward direction, leaf-springs **88** of locking elements **80**, spontaneously drive locking elements **80** in a downward direction which in turn drive unlocking element **82** in a downward direction as well. Upon spontaneous translation of unlocking element **82** in a downward direction, locking elements **80** are capable to assume a lower position within channels formed underneath flanking struts **72** in flanking sidewalls **60**; thereby rendering crate **30** readily transformable into open conformation, shown in FIG. **1**.

It is noted that due to the modularity of crate **30**, unlocking element **82** as well as locking elements **80** are readily replaceable in individual manner. Moreover even without or with dysfunctional unlocking element **82**, crate **30** still can be assembled into open conformation shown in FIG. **1** and used for its purpose.

It is further noted that due to geometrical proportions of unlocking element **82** relatively to locking elements **80**, a translational lever is formed wherein the terminal portion of unlocking element **82** exerts a force onto a centric portion of locking elements **80**, whereby the terminal portion of locking elements **80** is consequently elevated a greater distance than the terminal portion of unlocking element **82**. Consequently upon effecting a relatively minor vertical translation of unlocking element **82**, a relatively major vertical translation of the terminal portion of locking elements **80** is achieved; rendering crate **30** more easily and readily foldable into a folded configuration (not shown).

In accordance with some preferred embodiments of the present invention, reference is now made to FIGS. **6**A and **6**B showing flaking sidewall **60**, employing safety catch mechanism **190** preventing inadvertent opening of rotary locking element **180**. Rotary locking element **180** is pivoted on pivot **184** positioned typically somewhat offset the structured centric recess, in flanking sidewall **60**. Rotary locking element **180** further comprises or embodies leaf-spring **188**, extending from the top face upwards and towards pivot **184** of rotary locking element **180**.

Rotary locking element **180** is threaded into channel in flanking sidewall **60**, underneath flanking strut **72**. It is noted that the channel formed underneath flanking struts **72** is somewhat wider than terminal portion **186** of locking element **180**; thereby sustaining radial displacement of the latter within the former. Locking element **180** is rotatable upon pivot **184**, in flanking sidewalls **60**; thereby sustaining radial displacement of terminal portion **186** of locking elements **180** within channel formed underneath flanking strut **72** in flanking sidewalls **60**.

Flanking sidewall **60** shown in FIGS. **6**A and **6**B further comprises exemplary safety catch mechanism **190** preventing

inadvertent elevation rotation of rotary locking element **180**, within channel formed underneath flanking strut **72** in flanking sidewalls **60**. Rotary locking element **180** comprises exemplary extended protrusion **194**. The terminal portion of extended protrusion **194** is configured to be bent, folded or otherwise displaced in an upward direction, towards rotary locking element **180**, upon a force exerted from underneath, by the terminal portion of exemplary unlocking element **182**.

Upon forceful elevation of unlocking element **182** in an upward direction, top terminal portion of unlocking element **182** exerts a force onto the terminal portion of extended protrusion **194**; whereby the terminal portion of extended protrusion **194** is displaced in an upward direction, towards rotary locking element **180**. Thereafter rotary locking element **180** is capable to perform rotation upon pivot **184**, upon further elevation of unlocking element **182** in an upward direction, thereby sustaining radial displacement of terminal portion **186** of locking elements **180** within channel formed underneath flanking strut **72** in flanking sidewalls **60**.

However if no forceful elevation in an upward direction is applied to unlocking element **182**, locking element **180** is locked in place and rotation of rotary locking element **180** upon pivot **184** is precluded, because the terminal face of extended protrusion **194** is pushed against detent **192**, whereby radial displacement of terminal portion **186** of locking elements **180** within channel formed underneath flanking strut **72** in flanking sidewalls **60** is prevented. Consequently if an attempt to rotate locking element **180** in an upward direction is made, for instance upon opening of the foldable crate, safety catch mechanism **190** prevents rotation of rotary locking element **180** upon pivot **184**, because the terminal face of extended protrusion **194** is pushed against detent **192**; whereby inadvertent folding of the foldable crate is prevented.

It will be appreciated by persons skilled in the art that the present invention is not limited by what has been particularly shown and described herein above. Rather the scope of the invention is defined by the claims which follow:

What is claimed is:

1. A foldable crate comprises:

(a) a base platform, said base platform comprising:
  (1) a pair of longitudinal portions;
  (2) a pair of flanking portions;
  (3) at least one structural element, disposed adjacently to said longitudinal portions of said base platform;
  (4) at least one structural element, disposed adjacently to said flanking portions of said base platform;

(b) a pair of longitudinal sidewalk, each one of said longitudinal sidewalls comprising:
  (1) at least one structural element, configured to form a hinged connection with said at least one structural element disposed adjacently to said longitudinal portion of said base platform;
  (2) a tab, configured to serve as a gripping handle;
  (3) a pair of structured protrusions, extending inwardly from an inner surface of said longitudinal sidewall;
  (4) a U-shaped cut essentially surrounding said structured protrusions, thereby rendering said structured protrusions laterally displaceable, wherein upon exerting a force onto said structured protrusions, a biasing force is formed by a material at the basis of said U-shaped cut;

(c) a pair of flanking sidewalls, each one of said flanking sidewalk comprising:
  (1) at least one structural element, configured to form a hinged connection with said at least one structural element disposed adjacently to said flanking portion of said base platform;
  (2) a tab, configured to serve as a gripping handle;
  (3) a structured centric recess, essentially surrounding said tab;
  (4) a pair of flanking struts, forming a pair of channels in side portions of said flanking sidewall;
  (5) a pair of side recesses, forming openings on interior side of said flanking sidewall, configured to sustain a passage of said structured protrusions on said longitudinal sidewall through said openings;

(d) a pairs of rotary locking elements disposed on an exterior side of each one of said flanking sidewalls, each one of said locking elements comprising:
  (1) a pivot connectable to said flanking sidewall, upon which said locking element is rotatable;
  (2) a leaf-spring extending from a top face of said locking element upwardly, biasing said rotary locking element into a lower position;
  (3) a chamfered terminal front face, being inwardly slanted;

(e) an unlocking element disposed in said structured centric recess in said flanking sidewall, essentially underneath said tab, said unlocking element comprising:
  (1) at least one structural element for operatively connecting to said flanking sidewall, configured to sustain vertical translation of said unlocking element;
  (2) a pair of terminal portions, wherein each one of said terminal portions is configured to confer a rotational torque to said rotary locking element upon forceful elevation of said unlocking element in an upward direction.

2. The crate as in claim **1**, wherein said unlocking element comprises side ridges and wherein said side ridges of said unlocking element are inserted into grooves positioned along sides of said structured centric recess and slidable therein.

3. The crate as in claim **1**, wherein said longitudinal sidewalk further comprise separation bumper elements, wherein upon elevation of said unlocking element in an upward direction, top faces of terminal portions of said rotary locking elements collide with said separation bumper elements, thereby forming a rotational torque onto said flanking sidewalls towards base platform, thus initiating folding of said crate.

4. The crate as in claim **3**, wherein said separation bumper elements comprise an outwardly slanted bottom face, facing essentially inwardly and downwardly.

5. The crate; as in claim **1**, further comprises a safety catch mechanism preventing inadvertent rotation of said rotary locking elements.

6. The crate as in claim **5**, wherein said safety catch mechanism preventing inadvertent rotation of said rotary locking elements comprises:

(a) an extended protrusion forming a part of said rotary locking element, wherein said extended protrusion is configured to assume at least two different conformations selected from the group consisting of:
  (1) an activated conformation wherein a terminal portion of said extended protrusion is displaced in an upward direction, towards said rotary locking element, upon a force exerted from underneath by a terminal top portion of said unlocking element;
  (2) a default conformation wherein said extended protrusion is not displaced in said upward direction;

(b) a detent, said detent is configured to interact with said terminal portion of said extended protrusion in said default conformation, thereby preventing inadvertent rotation of said rotary locking element; said detent is further configured not to interact in said activated conformation, thereby sustaining rotation of said rotary locking element, upon a force exerted from underneath by said terminal top portion of said unlocking element.

7. A foldable crate comprises:

(a) a base platform comprising:

(1) a longitudinal portion, comprising at least one structural element, disposed adjacently to said longitudinal portion;

(2) a flanking portion, comprising at least one structural element, disposed adjacently to said flanking portion;

(b) at least one longitudinal sidewall comprising:

(1) at least one structural element, configured to form a hinged connection with said at least one structural element disposed adjacently to said longitudinal portion of said base platform;

(2) at least one structured protrusion, extending inwardly from an inner side of said longitudinal sidewall;

(c) at least one flanking sidewalk comprising at least one structural element, configured to form a hinged connection with said at least one structural element disposed adjacently to said flanking portion of said base platform;

(d) at least one rotary locking element disposed on an exterior side of said flanking side-wall, said rotary locking element comprising:

(1) a pivot connectable to said flanking sidewalk upon which said locking element is rotatable;

(2) a biasing means configured to spontaneously drive said rotary locking element into a lower position;

(e) at least one unlocking element comprising:

(1) at least one structural element operatively attachable to said flanking sidewall, configured to sustain vertical translation of said unlocking element;

(2) a pair of terminal portions, wherein each one of said terminal portions is configured to confer a rotational torque to said rotary locking element upon forceful elevation of said unlocking element;

wherein geometrical proportions of said unlocking element relative to said rotary locking element define a translational lever, wherein said terminal portion of said unlocking element exerts a force onto a centric portion of locking elements, whereby said terminal portion of said rotary locking element is translatable a greater distance than said terminal portion of unlocking element.

8. The crate as in claim **7**, wherein said flanking sidewall further comprises a U-shaped cut essentially surrounding said structured protrusion, thereby rendering said structured protrusion laterally displaceable, wherein upon exerting a force onto said structured protrusion, a biasing force is formed by a material at the basis of said U-shaped cut.

9. The crate as in claim **7**, wherein said flanking sidewall further comprises at least one side recess, forming an opening on an inner side of said flanking sidewall, configured to sustain a passage of said structured protrusion of said longitudinal sidewall through said opening.

10. The crate as in claim **7**, wherein said longitudinal sidewalls further comprise separation bumper elements, wherein upon elevation of said unlocking element in an upward direction, top faces of terminal portions of said rotary locking element collide with said separation bumper elements, thereby forming a rotational torque onto said flanking sidewalls towards base platform, thus initiating folding of said crate.

11. The crate as in claim **10**, wherein said separation bumper elements comprise an outwardly slanted bottom face, facing essentially inwardly and downwardly.

12. The crate, as in claim **8**, further comprises a safety catch mechanism preventing inadvertent rotation of said rotary locking elements.

13. The crate as in claim **12**, wherein said safety catch mechanism preventing inadvertent rotation of said rotary locking elements comprises:

(a) an extended protrusion forming a part of said rotary locking element, wherein said extended protrusion is configured to assume at least two different conformations selected from the group consisting of:

(1) an activated conformation wherein a terminal portion of said extended protrusion is displaced in an upward direction, towards said rotary locking element, upon a force exerted from underneath by a terminal top portion of said unlocking element;

(2) a default conformation wherein said extended protrusion is not displaced in said upward direction;

(b) a detent, said detent is configured to interact with said terminal portion of said extended protrusion in said default conformation, thereby preventing inadvertent rotation of said rotary locking element; said detent is further configured not to interact in said activated conformation, thereby sustaining rotation of said rotary locking element, upon a force exerted from underneath by said terminal top portion of said unlocking element.

14. The crate as in claim **7**, wherein said structured protrusion, extending inwardly from said inner surface of said longitudinal sidewall comprises an upwardly slanted back upper face.

15. The crate as in claim **7**, wherein said flanking sidewall comprises at least one flanking strut, forming a channel in a side portion of said flanking sidewall.

16. The crate as in claim **7**, wherein said flanking sidewall comprises at least one side recess, forming an opening on interior side of said flanking sidewall, configured to sustain a passage of said structured protrusion on said longitudinal sidewall through said opening.

17. The crate as in claim **7**, wherein said rotary locking element comprises a chamfered terminal front face, being inwardly slanted.

18. The crate as in claim **7**, wherein said at least one rotary locking element and said at least one unlocking element are modular and readily replaceable in individual manner.

19. The crate as in claim **7**, wherein geometrical proportions of said unlocking element relatively to said rotary locking element define a translational lever, wherein upon effecting a relatively minor vertical translation of said unlocking element, a relatively major vertical translation of said terminal portion of said locking element is achieved; thereby rendering crate readily foldable.

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